



AAR-100

Human Factors Newsletter # 03-13

July 19, 2003 – August 8, 2003

Recent Publications/Project Reports:

Ethanol Origin in Postmortem Urine: The LC/MS Determination of Serotonin Metabolites.
Robert D. Johnson, Russell J. Lewis and Dennis V. Canfield. Federal Aviation Administration, Civil Aerospace Medical Institute, Forensic Toxicology Research Team, Oklahoma City, OK.

Specimens from fatal aviation accident victims are submitted to the FAA's Civil Aerospace Medical Institute for toxicological analysis. During toxicological evaluations, ethanol analysis is performed on all cases. Care must be taken when interpreting a positive ethanol result due to the potential for postmortem ethanol formation. Several indicators of postmortem ethanol formation exist; however, none are completely reliable. The consumption of ethanol has been shown to alter the concentration of two major serotonin metabolites, 5-hydroxytryptophol (5-HTOL) and 5-hydroxyindole-3-acetic acid (5-HIAA). While the 5-HTOL/5-HIAA ratio is normally very low, previous studies using live subjects have demonstrated that the urinary 5-HTOL/5-HIAA ratio is significantly elevated for 11-19 hours after acute ethanol ingestion. The 5-HTOL/5-HIAA ratio is not affected by the microbial formation of ethanol. This methodology has not been routinely utilized for the determination of ethanol origin in forensic samples due to the difficulty of the analysis of these two compounds. Until now, two different analytical techniques were required to perform this analysis.

In our study, we investigated the 5-HTOL/5-HIAA ratio as a potential indicator of ethanol origin in postmortem urine samples. Our laboratory developed and validated a method for the simultaneous determination of 5-HTOL and 5-HIAA in forensic urine samples using a simple liquid/liquid extraction in combination with LC/MS/MS and LC/MS/MS/MS. The extraction employed provided an average recovery of approximately 80% for both compounds. The LC/MS method proved highly selective and sensitive, having an LOD of 0.1 ng/mL for both compounds. The accuracy and precision was also very good. Utilizing our LC/MS method, we examined the 5-HTOL/5-HIAA ratio in 21 ethanol-negative and 23 true ethanol-positive postmortem urine specimens. We found that all ethanol-negative specimens had 5-HTOL/5-HIAA ratios below 15 pmol/nmol, a previously established antemortem urine cutoff for recent ethanol ingestion. All ethanol-positive urine samples had 5-HTOL/5-HIAA ratios above 15 pmol/nmol. These results

validated the antemortem cutoff for use with postmortem urine specimens. This method is currently being used to examine cases suspected of containing postmortem ethanol.

NEXCOM: Engineering Research Psychologists from the NAS Human Factors Group (ACB-220) briefed the Air-Ground Communications Integrated Product Team (AND-360) on the results of the Next Generation Communications (NEXCOM) II simulation. The study compared communications performance and pilot acceptance of the proposed digital radio system in comparison to the current analog system under routine and severe weather conditions. The primary concerns of the study were the increased voice throughput delay, and features (anti-blocking, controller override, and transmit status indicators) of the NEXCOM radio. The results indicated that pilot transmission attempts were blocked or overridden approximately 14% of the time, but researchers believed the system was equal to or better than analog radios on multiple dimensions and was highly acceptable as is. Previous ACB-220 simulations found that the digital voice quality was as intelligible and acceptable as analog, and that the throughput delay and features did not negatively affect controller communications. (M. McNulty, ACB-220)

Controller Displays: On August 5-6, 2003, a researcher from the NAS Human Factors Group (ACB-220) participated with members of the Surveillance Integration Team (SIT) in a demonstration of multi-sensor, asynchronous controller display updating at the Lockheed Martin facility in Eagan, MN. The SIT is developing display specification recommendations for integrating Automatic Dependent Surveillance – Broadcast data onto terminal radar displays. (E. Stein, WJHTC)

*More information on human factors research can be found at
the FAA Human Factors (AAR-100) web site: <http://www.hf.faa.gov>*

Mark D. Rodgers
FAA (AAR-100)



August 12-13, 2003 – REDAC Human Factors Subcommittee Meeting, Washington, DC
<mailto:gloria.dunderman@faa.gov>

August 19-21, 2003 – Fifth NASA/FAA Workshop on Risk Analysis and Safety Performance Measurements in Aviation, Baltimore, MD <http://aar400.tc.faa.gov/aar424/Workshop2003/>

September 3-10, 2003 – EUROCONTROL 11th Air Navigation Conference and Exhibition, Montreal, Canada <http://www.eurocontrol.be/newsroom/events/index.html>

September 8-12, 2003 – EUROCONTROL 9th Global TRAINAIR Conference and Training Symposium, <http://www.eurocontrol.be/newsroom/events/index.html>

September 8-12, 2003 – SAE Aerospace Congress and Exhibition, Palais des Congrès, Montreal, Quebec, Canada <http://www.sae.org/calendar/aeromtgs.htm>

September 8-12, 2003 – 17th Annual HCI Conference, Bath England <http://www.bcs-hci.org.uk/hci2003/>

September 15-17, 2003 – FAA/TCA/CAA Safety Management in Aviation Maintenance Symposium, Toronto, Canada

September 16 – 18, 2003 - 29th European Rotorcraft Forum, Friedrichshafen, Germany. Contact B. Gmelin at bernd.gmelin@dir.de

September 16-18, 2003 – MRO Europe, Cardiff International Arena, Cardiff, Wales <http://www.awgnet.com/conferences/meumain.htm>

September 16-19, 2003 – Investigation and Reporting of Incidents and Accidents (IRIA), Williamsburg, VA <http://shemesh.larc.nasa.gov/iria03/>

September 17-18, 2003 – FAA Research, Engineering and Development Advisory Committee (REDAC) Meeting, Washington, DC <mailto:gloria.dunderman@faa.gov>

September 17-19, 2003 – 3rd Air Cargo Economics Conference, Sheraton Amsterdam Airport Hotel & Conference Center, Netherlands <http://www.euroavia.com/conf/default.html>

September 17-21, 2003 - Institute of Electrical and Electronics Engineers (IEEE) 25th Annual Engineering in Medical and Biology Society International Conference, Cancun, Mexico <http://itzamna.uam.mx/cancun/>

September 18-19, 2003 – National Academy of Engineering 2003 Frontiers of Engineering Symposium, Irvine, CA [Welcome to the National Academy of Engineering \(NAE\)](http://www.nae.org/Welcome_to_the_National_Academy_of_Engineering_(NAE))

September 22-24, 2003 - 41st Annual SAFE Symposium, Jacksonville, FL <http://www.safeassociation.org/2003symposium1.htm>

September 22 – October 3, 2003 – ICAO 11th Air Navigation Conference, Montreal, Canada <http://www.icao.int/icao/en/anb/meetings/anconf11/index.html>

September 24-25, 2003 –IATA/ICAO/Flight Safety Foundation ICARUS Committee/University of Texas LOSA Meeting, Montreal, Canada <mailto:helmreich@mail.utexas.edu>

September 24-26, 2003 - Institute of Electrical and Electronics Engineers (IEEE) International Symposium on Technology and Society, Amsterdam, The Netherlands
<http://radburn.rutgers.edu/andrews/projects/ssit/istas03.pdf>

October 5-8, 2003 - Institute of Electrical and Electronics Engineers (IEEE) International Conference on Intelligent Control, Houston, TX <http://vlab.ee.nus.edu.sg/~isic2003/>

October 5-8, 2003 - 2003 IEEE International Conference on Systems, Man, and Cybernetics, Washington, DC http://becat.engr.uconn.edu/IEEE_CSMC_2003/

October 6 – 9, 2003 - NATO Research and Technology Agency, Applied Vehicle Technology Panel (AVT) will present "The Vehicle Propulsion Integration Symposium" in Poland. For more information contact cheynes@rta.nato.int

October 7 – 9, 2003 - National Business Aviation Association Annual Meeting & Convention, Orlando, Florida. Contact: www.nbaa.org

October 13-17, 2003 – Human Factors and Ergonomics Society 47th Annual Meeting, Adams Mark Denver Hotel, Denver, CO <http://www.hfes.org/>

October 15, 2003 – Royal Aeronautical Society Conference on Mitigating Human Error, London UK <http://www.aerosociety.com/homepage.asp>

October 17-19, 2003 – EUROCONTROL IFATCA European Regional Meeting, Porto
<http://www.eurocontrol.be/newsroom/events/index.html>

October 19-21, 2003 – IEEE Symposium on Information Visualization, Doubletree Hotel, Seattle Airport, WA <http://infovis.org/infovis2003/>

October 21-23, 2003 – 7th IEEE International Symposium on Wearable Computers, Crowne Plaza Hotel, White Plains, NY <http://www.cc.gatech.edu/ccg/iswc03/>

October 26-30, 2003 – ATCA 48th Annual International Technical Program and Exhibits, Marriott Wardman Park Hotel, Wash, DC http://www.atca.org/static2_item.asp?item_ID=19

October 27-28, 2003 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, DC <http://wwwsearch.nationalacademies.org/>

October 27-30, 2003 – SAE DoD Maintenance Symposium and Exposition, Valley Forge Convention Center, King of Prussia, PA <http://www.sae.org/calendar/aeromtg.htm>

November, 2003(tentative) – DOD TAG-50, Fall 2003, Phoenix, AZ
<http://hfetag.dtic.mil/meetschl.html>

November 5-6, 2003 – Royal Aeronautical Society Flight Simulation Group Conference on "Simulation of the Environment", London, UK <http://www.raes.org.uk/homepage.asp>

November 5-7, 2003 – FAA Centers of Excellence 3rd Joint Annual Meeting, Daytona Beach Hilton Oceanside Resort, Daytona Beach, FL

http://www.embryriddle.edu/research/FAA_COE_Meeting/index.html

November 5-7, 2003 – 5th International Conference on Multi-Modal Interfaces, Marriott Vancouver Pinnacle Hotel, Vancouver, British Columbia, Canada <http://www.acm.org/uist/>

November 17-20, 2003 – 56th Annual Air Safety Seminar, A Joint Meeting of Flight Safety Foundation, International Federation of Airworthiness, and International Air Transport Association, Bangkok, Thailand <http://www.flightsafety.org/seminars.html>

December 2-4, 2003: National Training Systems Association Inter-Service/Industry Training, Simulation and Education Conference (I/ITSEC), Orlando, FL <http://www.trainingsystems.org>

December 3-5, 2003 – FAA System Engineering Annual Workshop with Information Systems Security – Meeting Real World Challenges, Holiday Inn, Atlantic City, NJ <http://se-iss.tc.faa.gov>

December 9-12, 2003 - Institute of Electrical and Electronics Engineers (IEEE) Decision and Control Conference, Maui, HI <http://www2.acae.cuhk.edu.hk/~ycliu/cdc03/>

January 11-15, 2004 – Transportation Research Board Annual Meeting, Washington, DC <http://www4.trb.org/trb/annual.nsf>

January 18-22, 2004 – Conference on Visualization and Data Analysis, San Jose Marriott and San Jose Convention Center, San Jose, CA <http://vw.indiana.edu/vda2004/>

January 21 – 23, 2004 - AHS 4th Decennial Specialists' Meeting on Aeromechanics, Fisherman's Wharf, San Francisco, CA. For more information contact the Technical Chairman, Tom Maier at tmaier@mail.acr.nasa.gov

March 22-24, 2004 – Eye Tracking Research and Applications Symposium, Menger Hotel, San Antonio, TX <http://www.e-t-r-a.org/>

March 22-25, 2004 – HPSAA II Conference, Human Performance, Situation Awareness, and Automation Technology, hosted by Embry-Riddle Aeronautical University and the University of Central Florida, Hilton Oceanfront Resort, Daytona Beach, FL <http://faculty.erau.edu/vincenzd/hpsaa>

March 23-26, 2004 – 4th International Workshop on Smart Appliances and Wearable Computers, Tokyo, Japan <http://www.unl.im.dendai.ac.jp/IWSAWC/>

April, 2004 – SAE General Aviation Technology Conference and Exhibition, Century II Convention Center, Wichita, KS <http://www/sae.org/calendar/aeromtg.htm>

April 18-21, 2004 – FAA Worldwide Airport Technology Transfer Conference, Hilton Atlantic City Hotel, Atlantic City, NJ <http://www.airtech.tc.faa.gov/att04/>

May 3-6, 2004 – 75th Annual Scientific Meeting of the Aerospace Medical Association, Egan Convention Center, Anchorage, AK <http://www.asma.org/>

May 6-8, 2004 - AHS International 60th Annual Forum and Technology Display, Virginia Beach, VA. Contact Staff@vtol.org

May 10-12, 2004 – Royal Aeronautical Society 10th AIAA CEAS Aeroacoustics Conference, Manchester Town Hall, UK <http://www.aerosociety.com/homepage.asp>

May 26-27, 2004 – Royal Aeronautical Society Conference – Flight Simulation 1929-2029, A Centennial Perspective, London, UK <http://www.aerosociety.com/homepage.asp>

July 27-August 2, 2004 – 52nd Annual AirVenture, Oshkosh, WI <http://airventure.org/>

July 28 – August 1, 2004 – 112th Convention of the American Psychological Association. Honolulu, Hawaii <http://www.apa.org/convention>

August 1-4, 2004 – Designing Interactive Systems, Cambridge, MA
<http://www.sigchi.org/DIS2004/>

September 20-24, 2004 – Human Factors and Ergonomics Society 48th Annual Meeting, Sheraton New Orleans Hotel, New Orleans, LA <http://www.hfes.org/>

October 18-19, 2004 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, DC <http://wwwsearch.nationalacademies.org/>

May 9-12, 2005 - 76th Annual Scientific Meeting of the Aerospace Medical Association, Kansas City, MO <http://www.asma.org/>

October 24-25, 2005 – National Academies Institute of Medicine Annual Meeting, National Academy of Sciences, Washington, DC <http://wwwsearch.nationalacademies.org/>

Note: Calendar events in Italics are new since the last Newsletter



Comments or questions regarding this newsletter?

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